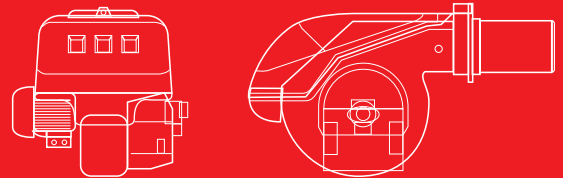




# RL Series

## Two Stage Light Oil Burners

RL 34 MZ	97/154	÷	395	kW
RL 44 MZ	155/235	÷	485	kW
RL 50	148/296	÷	593	kW
RL 64 MZ	206/391	÷	830	kW
RL 70	255/474	÷	830	kW
RL 100	356/711	÷	1186	kW
RL 130	486/948	÷	1540	kW
RL 190	759/1423	÷	2443	kW
RL 250 MZ	600/1250	÷	2700	kW



The RL series of burners covers a firing range from 154 to 2700 kW, and it has been designed for use in low or medium temperature hot water boilers, hot air or steam boilers, diathermic oil boilers.

Operation is "two stage"; the burners are fitted with a microprocessor-based control panel, which supplies indication of burner status and fault causes.

Optimisation of sound emissions is guaranteed by the special design of the air suction circuit and by incorporated sound proofing material.

The elevated performance of the fans and combustion head, guarantee flexibility of use and excellent working at all firing rates.

The exclusive design ensures reduced dimensions, simple use and maintenance. A wide range of accessories guarantees elevated working flexibility.

## Technical Data

MODEL		RL 34 MZ	RL 44 MZ	RL 50	RL 64 MZ		
Burner operation mode		Two stage					
Modulation ratio at max. output		2 ÷ 1					
Servomotor	type	-					
	run time s	-					
Heat output	kW	97/154 ÷ 395	155/235 ÷ 485	148/296 ÷ 593	206/391 ÷ 830		
	Mcal/h	83/133 ÷ 340	133/204 ÷ 418	127/255 ÷ 510	177/296 ÷ 716		
	Kg/h	8.3/16 ÷ 33.6	13/20 ÷ 41	12.5/25 ÷ 50	17.4/33 ÷ 70		
Working temperature	°C min./max.	0/40					
<b>FUEL/AIR DATA</b>							
Light oil	net calorific value	kWh/kg	11.86				
		kcal/kg	10200				
	viscosity at 20°C	mm <sup>2</sup> /s (cSt)	4 ÷ 6				
Pump	type	AN 57C	AN67C	AL 75C	AL 95C		
	delivery at 12 bar	Kg/h	45	67	88	107	
Atomised pressure	bar	12					
Fuel temperature	max. °C	50					
Fan	type	(02)	(02)	(01)	(02)		
Air temperature	max. °C	60					
<b>ELECTRICAL DATA</b>							
Electrical supply	Ph/Hz/V	(04)	(04)	(06)	(09)	(05)	
Auxiliary electrical supply	Ph/Hz/V	(04)	(04)		(03)	(03)	
Control box	type	RMO					
Total electrical power	kW	0.60	0.70	0.75	0.75	1.40	
Auxiliary electrical power	kW	0.30	0.28	0.30	0.10	0.30	
Protection level	IP	2XD		44	44		
Fan motor	electrical power	kW	0.30	0.42	0.45	0.65	1.10
	rated current	A	2.4	3.0	2 - 1.2	3 - 1.7	4.7 - 2.7
	start up current	A	9.6	12	9.5 - 5.5	13.8 - 8	24.5 - 14
	protection level	IP	20	44	54	55	
Ignition transformer	V1 - V2	230V - 2x12kV		230V - 2x5kV	230V - 2x12kV		
	I1 - I2	0.2A - 30mA		1.9A - 30mA	0.2A - 30mA		
Operation		(11)		(10)	(11)		
<b>EMISSIONS</b>							
Noise levels	Sound pressure	dB (A)	68	70	75	76	
	Sound power	dB (A)	79	81	86	87	
	CO emission	mg/kWh	13	11	< 40	< 40	
Light oil	grade of smoke indicator	N° Bacharach	< 1				
	CxHy emission	mg/kWh	< 10 (after the first 20s)				
	NOx emission	mg/kWh	< 158	< 173	< 200	< 185	
<b>APPROVAL</b>							
Directive		2006/42/EC - 2014/30/UE - 2014/35/UE					
Conforming to		EN 267					

(01) Centrifugal with reverse curve blades

(02) Centrifugal with forward curve blades

(03) 1/50/230~(±10%)

(04) 1/50-60/230~(±10%)

(05) 3/50/230-400~(±10%)

(06) 3/50-60/230-400~(±10%)

(07) 3/50/400~(±10%)

(08) 3/50/230~(±10%)

(09) 3N/50/400~(±10%) ∩ 3/50/230~(±10%) △

(10) Intermittent (at least one stop every 24 h)

(11) Intermittent (at least one stop every 24 h) - Continuous as optional (at least one stop every 72 h)

Reference conditions:

Temperature: 20°C - Pressure: 1013,5 mbar - Altitude: 0 m a.s.l. - Noise measured at a distance of 1 meter.

Sound pressure measured in manufacturer's combustion laboratory, with burner operating on test boiler and at maximum rated output. The sound power is measured with the "Free Field" method, as per EN 15036, and according to an "Accuracy: Category 3" measuring accuracy, as set out in EN ISO 3746.

MODEL		RL 70	RL 100	RL 130	RL 190	RL 250 MZ	
Burner operation mode		Two stage					
Modulation ratio at max. output		2 ÷ 1					
Servomotor	type	-			LKS 210		
	run time s	-			7		
Heat output	kW	255/474 ÷ 830	356/711 ÷ 1186	486/948 ÷ 1540	759/1423 ÷ 2443	600/1250 ÷ 2700	
	Mcal/h	219/408 ÷ 714	306/612 ÷ 1020	418/816 ÷ 1325	653/1224 ÷ 2100	516/1075 ÷ 2322	
	Kg/h	21.5/40 ÷ 70	30/60 ÷ 100	41/80 ÷ 130	64/120 ÷ 206	51/106 ÷ 228	
Working temperature	°C min./max.	0/40					
<b>FUEL/AIR DATA</b>							
Light oil	net calorific value	kWh/kg		11.86			
		kcal/kg		10200			
	viscosity at 20°C	mm <sup>2</sup> /s (cSt)		4 ÷ 6			
Pump	type	AL 95C	AJ 6CC	J7C	J7 4PT		
	delivery at 12 bar	Kg/h	107	164	230		
Atomised pressure	bar	12					
Fuel temperature	max. °C	50					
Fan	type	(01)		(02)			
Air temperature	max. °C	60					
<b>ELECTRICAL DATA</b>							
Electrical supply	Ph/Hz/V	(09)		(08) - (07)	(07)		
Auxiliary electrical supply	Ph/Hz/V	(03)					
Control box	type	RMO					
Total electrical power	kW	1.4	1.8	2.6	5.9	7.2	
Auxiliary electrical power	kW	0.30		0.40	1.40	0.60	
Protection level	IP	44					
Fan motor	electrical power	kW	1.1	1.5	2.2	4.5	6.6
	rated current	A	4,8 - 2.8	5,9 - 3,4	8,8 - 5,1	15,8 - 9,1	14,8 - 8,5
	start up current	A	25 - 14,6	27,7 - 16	57,2 - 33,2	126 - 73	114 - 66
	protection level	IP	54			55	
Ignition transformer	V1 - V2	230V - 2x5kV					
	I1 - I2	1.9A - 30mA			1.9A - 35mA		
Operation		(10)			(11)		
<b>EMISSIONS</b>							
Noise levels	Sound pressure	dB (A)	75	77	78,5	83,9	85,4
	Sound power	dB (A)	86	88	89,5	94,9	96,4
	CO emission	mg/kWh	< 40				
Light oil	grade of smoke indicator	N° Bacharach	< 1				
	CxHy emission	mg/kWh	< 10 (after the first 20s)				
	NOx emission	mg/kWh	< 200			< 185	
<b>APPROVAL</b>							
Directive	2006/42/EC - 2014/30/UE - 2014/35/UE						
Conforming to	EN 267						

(01) Centrifugal with reverse curve blades

(02) Centrifugal with forward curve blades

(03) 1/50/230~(±10%)

(04) 1/50-60/220-230~(±10%)

(05) 3/50/230-400~(±10%)

(06) 3/50-60/220-400~(±10%)

(07) 3/50/400~(±10%)

(08) 3/50/230~(±10%)

(09) 3N/50/400~(±10%) ∩ 3/50/230~(±10%) △

(10) Intermittent (at least one stop every 24 h)

(11) Intermittent (at least one stop every 24 h) - Continuous as optional (at least one stop every 72 h)

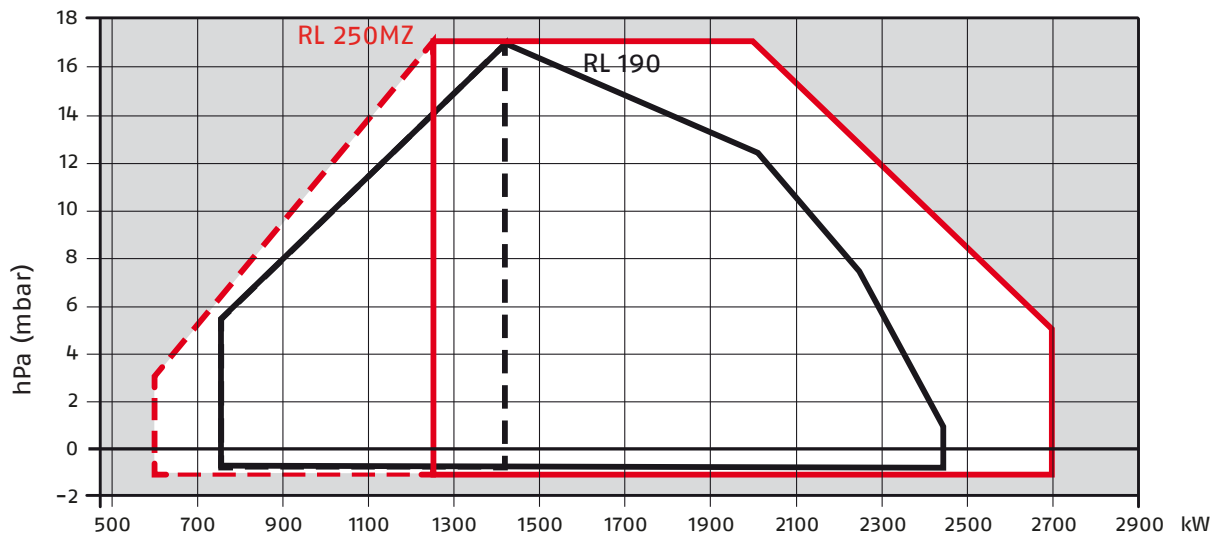
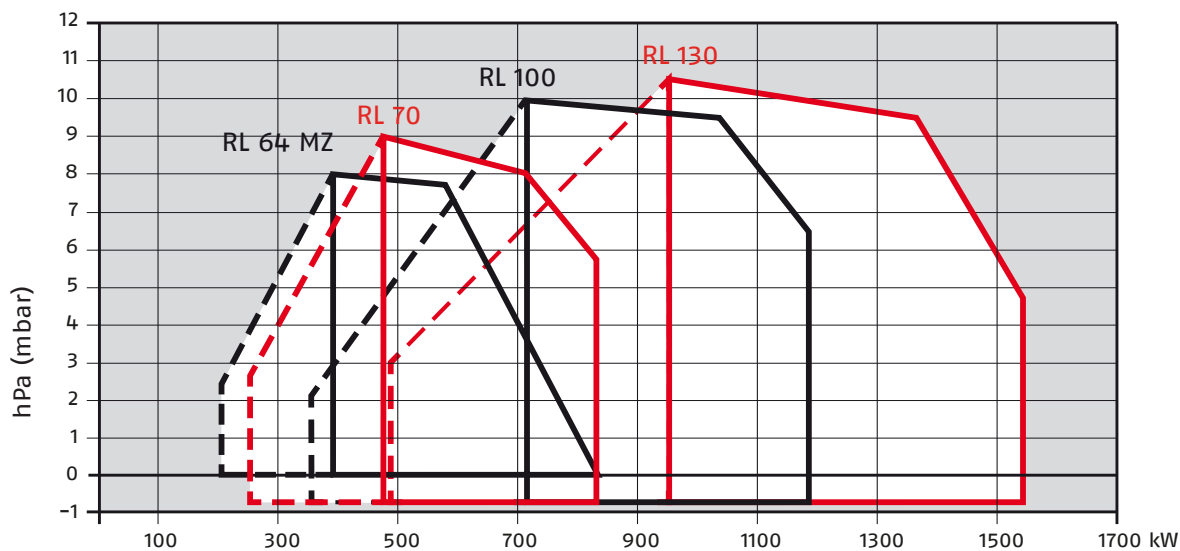
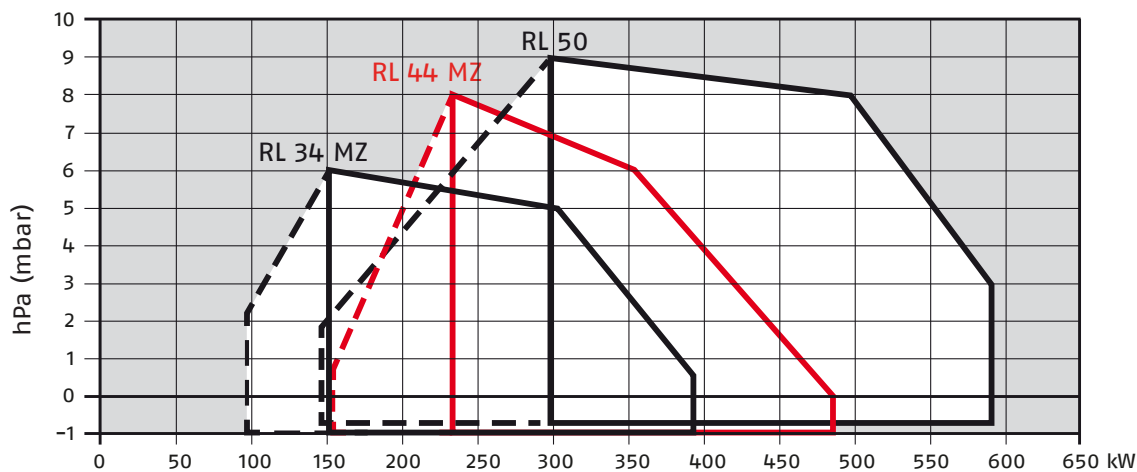
Reference conditions:


Temperature: 20°C - Pressure: 1013,5 mbar - Altitude: 0 m a.s.l. - Noise measured at a distance of 1 meter.


Sound pressure measured in manufacturer's combustion laboratory, with burner operating on test boiler and at maximum rated output. The sound power is measured with the "Free Field" method, as per EN 15036, and according to an "Accuracy: Category 3" measuring accuracy, as set out in EN ISO 3746.



## Firing Rates



 Useful firing rate for choosing the burner

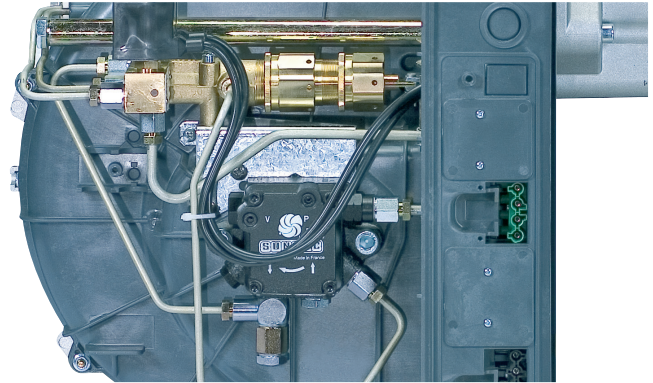
 1st stage operation range

Test conditions conforming to EN267  
 Temperature: 20°C  
 Pressure: 1013,5 mbar  
 Altitude: 0 m a.s.l.

# Fuel Supply

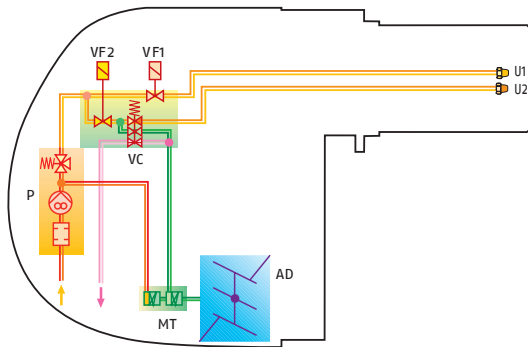
## HYDRAULIC CIRCUIT

The burners are fitted with three valves (a safety valve and two oil delivery valves). A control device, on the basis of required output, regulates oil delivery valves opening, allowing light oil passage through the valves and the nozzle. Delivery valves opening supplies the two-stage hydraulic ram which regulates air delivery in relation to the fuel burnt. The pumping group is fitted with a pump, an oil filter and a regulating valve, that adjust atomised pressure.

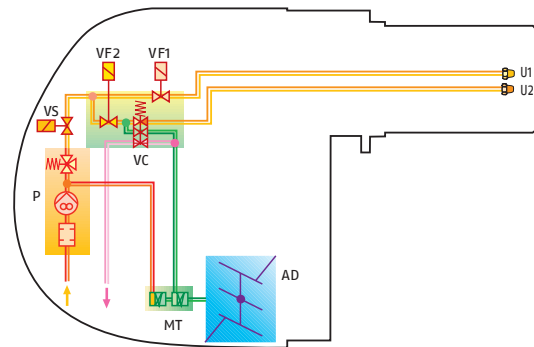


Example of adjustable hydraulic ram of RL 34 - 44 MZ burners.

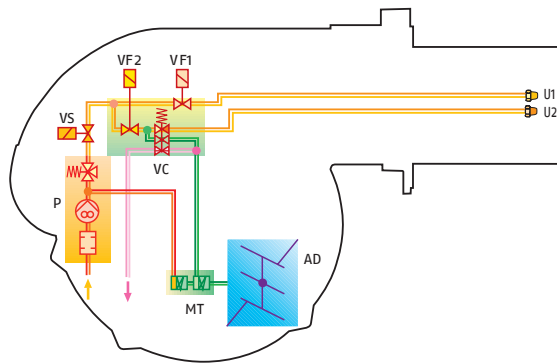
RL 34 MZ



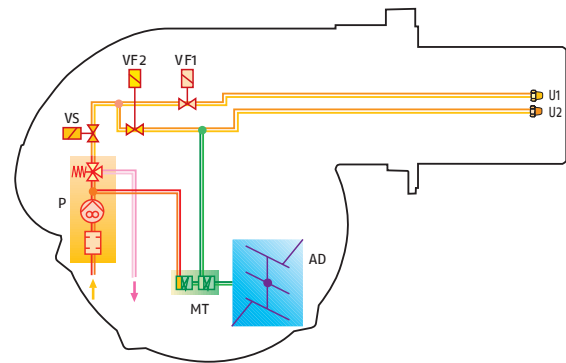
RL 44 MZ - RL 50 - RL 64 MZ



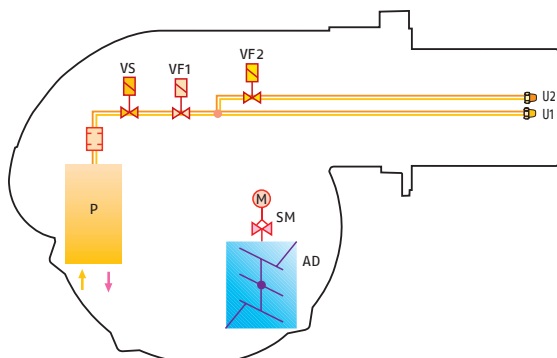
RL 70 - 100 - 130



RL 190



RL 250 MZ



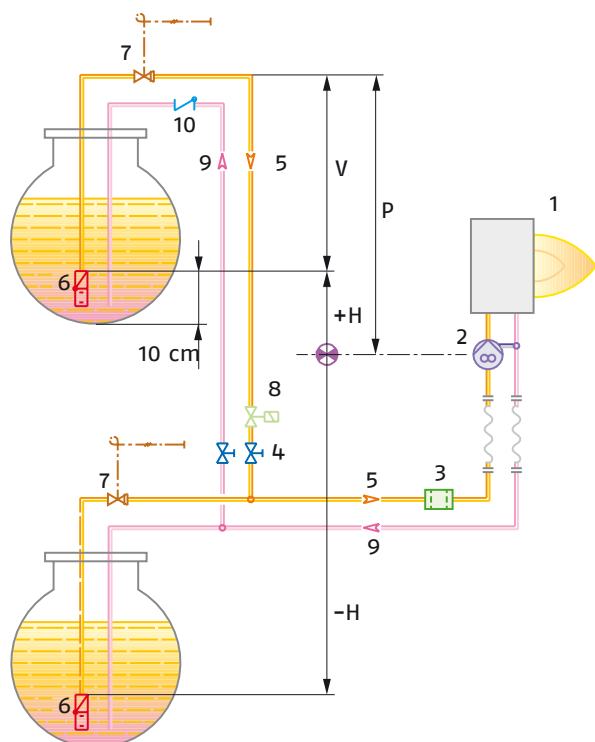
P	Pump with filter and pressure regulator on the output circuit
VS	Safety valve on the output circuit
VF1	1 <sup>st</sup> stage valve
VF2	2 <sup>nd</sup> stage valve
VC	2 <sup>nd</sup> stage control device
MT	Hydraulic ram
AD	Air damper
U1	1 <sup>st</sup> stage nozzle
U2	2 <sup>nd</sup> stage nozzle

**DIMENSIONING OF THE FUEL SUPPLY LINES**

The fuel feed must be completed with the safety devices required by the local norms. The table shows the choice of piping diameter for the various burners, depending on the difference in height between the burner and the tank and their distance.

**Maximum equivalent length of the pipework L (m)**

Model	RL 34 MZ			RL 44 - 50 MZ			RL 70 - 100 - 130			RL 190 - 250 MZ	
	Ø 10 mm	Ø 12 mm	Ø 14 mm	Ø 10 mm	Ø 12 mm	Ø 14 mm	Ø 12 mm	Ø 14 mm	Ø 16 mm	Ø 16 mm	Ø 18 mm
+H, -H (m)	L max (m)	L max (m)	L max (m)	L max (m)	L max (m)	L max (m)	L max (m)	L max (m)	L max (m)	L max (m)	L max (m)
+4,0	63	144	150	51	112	150	71	138	150	60	80
+3,0	55	127	150	46	99	150	62	122	150	50	70
+2,0	48	111	150	39	86	150	58	106	150	40	60
+1,5	44	102	150	35	79	147	51	98	150	35	55
+1,0	40	94	150	32	73	144	44	90	150	30	50
+0,5	37	86	150	29	65	132	40	82	150	25	45
0	33	78	150	26	60	120	36	74	137	20	40
-0,5	29	70	133	23	54	106	32	66	123	18	35
-1,0	25	63	118	20	47	96	28	56	109	15	30
-1,5	21	56	103	16	40	83	23	49	95	13	25
-2,0	17	45	88	13	34	71	19	42	81	10	20
-3,0	10	29	58	7	21	46	10	26	53	5	10
-4,0	4	12	28	2	8	21	3	10	25	3	6



H	Difference in height
Ø	Internal pipe diameter
P	Height 10 m
V	Height 4 m
1	Burner
2	Pump
3	Filter
4	Manual shut off valve
5	Suction pipework
6	Bottom valve
7	Remote controlled rapid manual shut off valve (compulsory in Italy)
8	Type approved shut off solenoid valve (compulsory in Italy)
9	Return pipework
10	Check valve

With ring distribution oil systems, the feasible drawings and dimensioning are the responsibility of specialised engineering studios, who must check compatibility with the requirements and features of each single installation.

## Ventilation

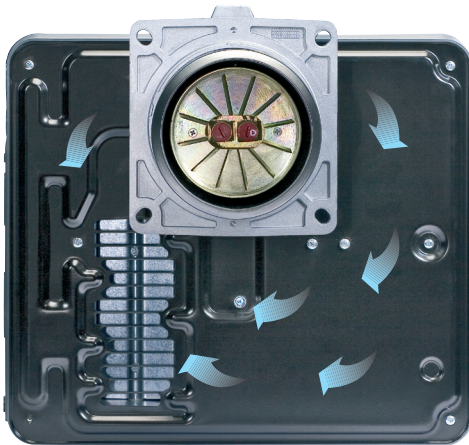
The ventilation circuit produces low noise levels with high performance pressure and air output, in spite of the compact dimensions.

The use of sound-proof material keeps noise level very low.

An hydraulic ram allows to have a right air flow in any operational moment and the closure of the air damper with burner in stand-by.



Example of the air damper on RL 50 burners.



Example of HCS (Housing Cooling System) working concept.

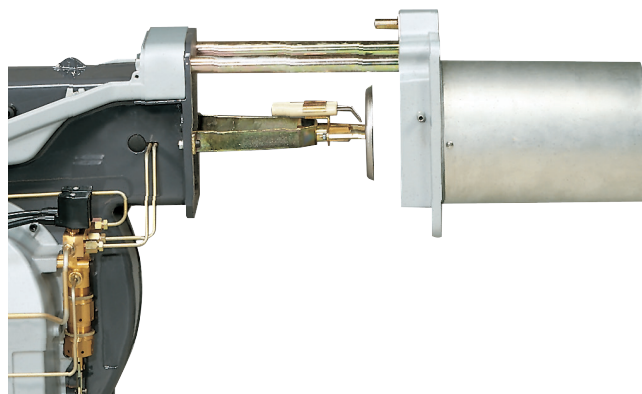
The RL 34 MZ and RL 44 MZ are realised with a new structure made by an innovative technology based on a new fiberglass reinforced polyamide material, with high thermal and mechanical characteristics, instead of the traditional aluminium.

This allows big advantages in terms of lay-out rationalisation, weight and dimensions reduction. In order to guarantee the correct exercise temperature for the internal burner components in every working conditions, the new structure includes an innovative patented cooling technology.

Between the burner front base and the reinforcing steel front plate, had been create an air cavity offering an high thermal insulation against the front boiler reflection heat, and to further improve the insulation efficiency the innovative **HCS (Housing Cooling System)** technology had been developed. Inside the front base cavity an air circulation is activated with continuous air volume refresh to obtain an active cooling system and avoid any heat transfer to the electrical component housing.

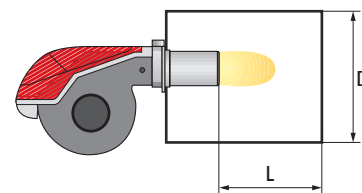
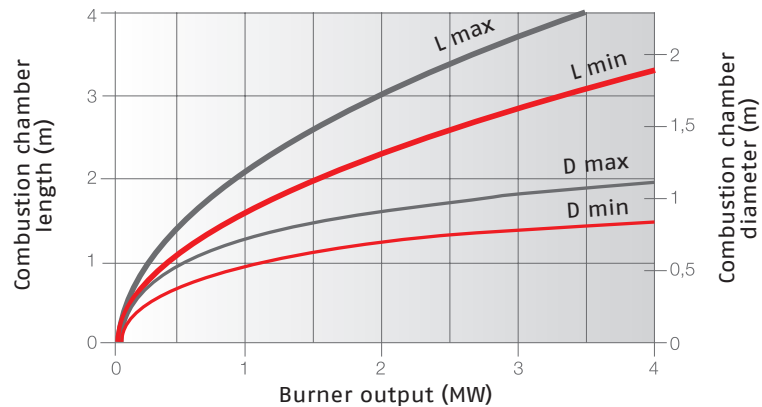
## Combustion Head

Different lengths of the combustion head can be chosen for the RL series of burners. The choice depends on the thickness of the front panel and the type of boiler. Depending on the type of generator, check that the penetration of the head into the combustion chamber is correct. The internal position of the combustion head can easily be adjusted to the maximum defined output by adjusting a screw fixed to the flange.



Example of a RL burner combustion head.

### DIMENSIONS OF THE COMBUSTION CHAMBER

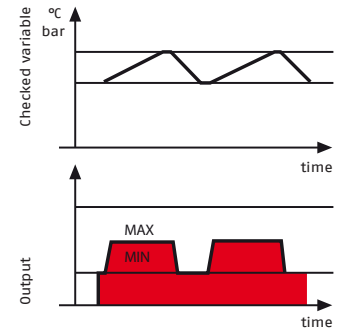


Example:  
 Burner thermal output = 2000 kW;  
 L Combustion chamber (m) = 2,7 m (medium value);  
 D Combustion chamber (m) = 0,8 m (medium value)

# Operation

## BURNER OPERATION MODE

With two stage operation, the RL burners can follow the temperature load requested by the system. A modulation ratio of 2:1 is reached, thanks to the "two nozzles" technique; the air is adapted to the hydraulic ram positions. On "two stage" operation, the burner gradually adjusts output to the requested level, by varying between the two pre-set levels.



Two stage operation

All RL series burners are fitted with a new microprocessor control panel for the supervision during intermittent operation. For helping the commissioning and maintenance work, there are two main elements:



The lock-out reset button is the central **operating element** for resetting the burner control and for activating / deactivating the diagnostic functions.



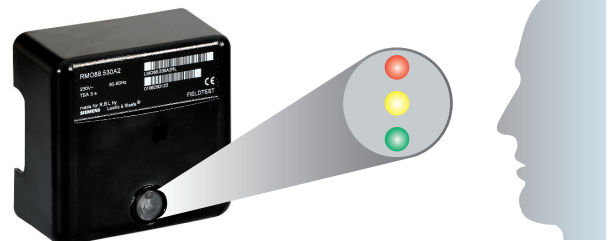
The multi-color LED is the central **indication element** for visual diagnosis and interface diagnosis.

Both elements are located under the transparent cover of lockout reset button, as showed below.



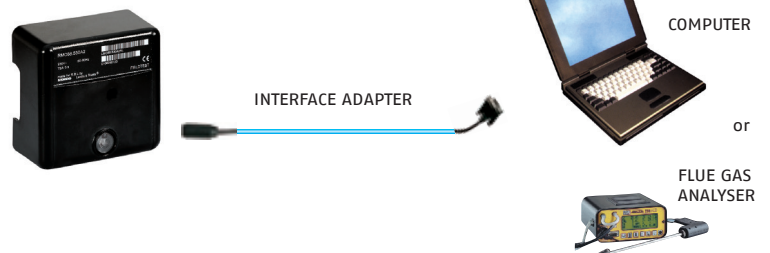
There are two diagnostic choices, for indication of operation and diagnosis of fault cause:

**- visual diagnosis:**



**- interface diagnosis:**

By the interface adapter and a PC with dedicated software or by a predisposed flue gas analyzer (see paragraph accessories).



**Indication of operation:**

In normal operation, the various status are indicated in the form of colour codes according to the table below.

The interface diagnosis (with adapter) can be activated by pressing the lock-out button for > 3 seconds.

Color code table	
Operation status	Color code
Stand-by	● ● ● ● ● ● ● ●
Pre-purging	○ ○ ○ ○ ○ ○ ○ ○
Ignition phase	○ ● ○ ● ○ ● ○ ●
Flame OK	● ● ● ● ● ● ● ●
Poor flame	● ● ● ● ● ● ● ●
Undervoltage, built-in fuse	○ ● ○ ● ○ ● ○ ●
Fault, alarm	● ● ● ● ● ● ● ●
Extraneous light	● ● ● ● ● ● ● ●

**Diagnosis of fault causes:**

After lock-out has occurred, the red signal lamp is steady on. In this status, the visual fault diagnosis according to the error code table can be activated by pressing the lock-out reset button for > 3 seconds.

The interface diagnosis (with adapter) can be activated by pressing again the lock-out button for > 3 seconds. The flashing of red LED are a signal with this sequence:

(e.g. signal with n° 3 flashes – faulty air pressure monitor)



**Error code table**

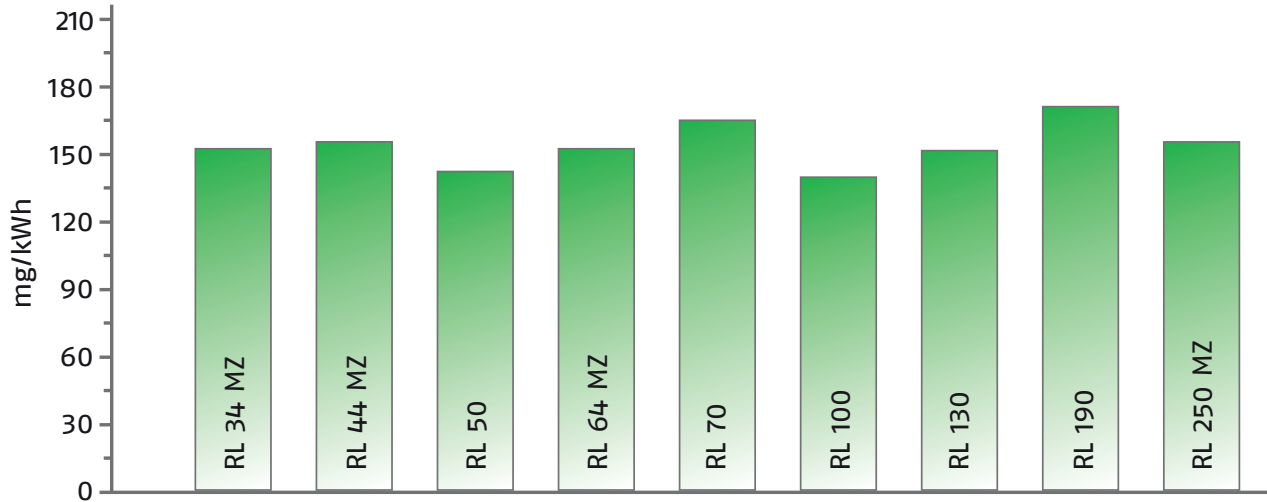
Flash code	Possible cause of fault
2 flashes ● ●	No establishment of flame at the end of safety time: - faulty or soiled fuel valves - faulty or soiled flame detector - poor adjustment of burner, no fuel - faulty ignition equipment
3 flashes ● ● ●	Faulty air pressure monitor
4 flashes ● ● ● ●	Extraneous light or simulation of flame on burner start up
7 flashes ● ● ● ● ● ● ●	Loss of flame during operation: - faulty or soiled fuel valves - faulty or soiled flame detector - poor adjustment of burner
10 flashes ● ● ● ● ● ● ● ● ● ●	Wiring error or internal fault



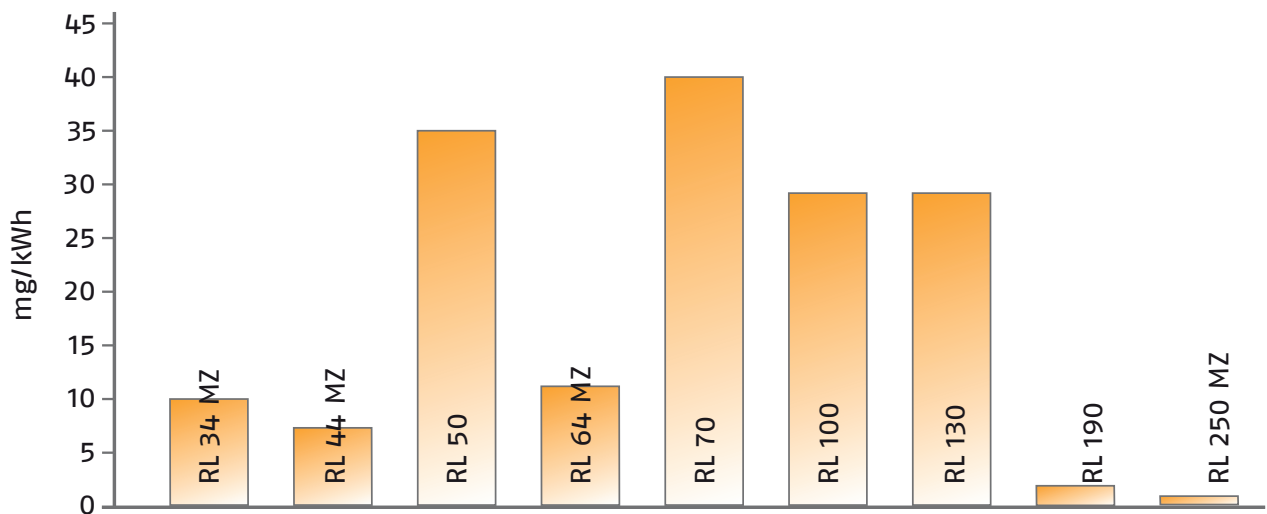
## Emissions

The emission data have been measured in the various models at maximum output, in conformity with EN 267 standard.

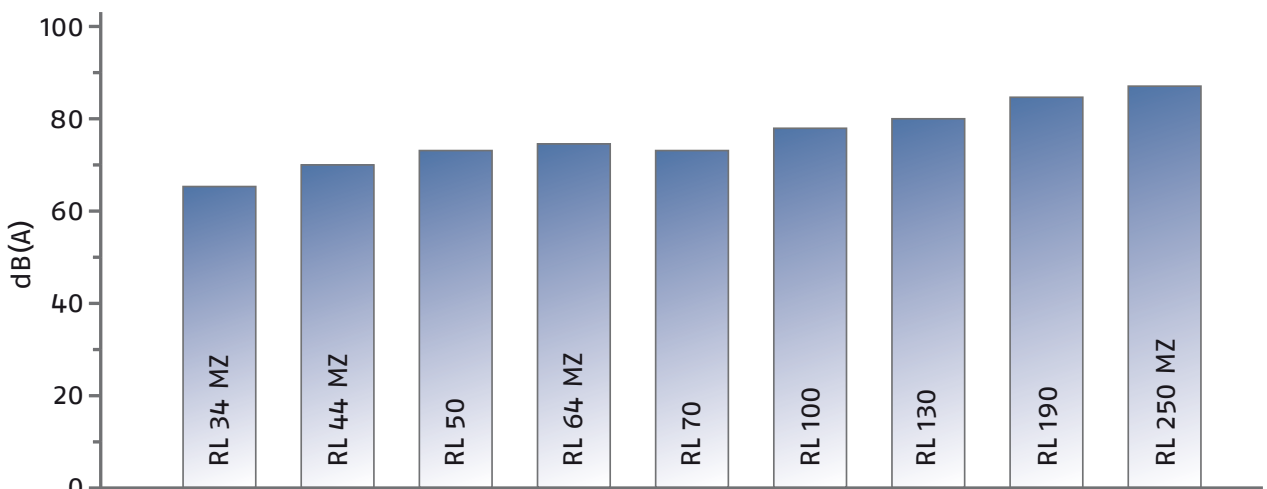
### NO2 EMISSIONS



### CO EMISSIONS



### SOUND EMISSIONS (sound pressure)

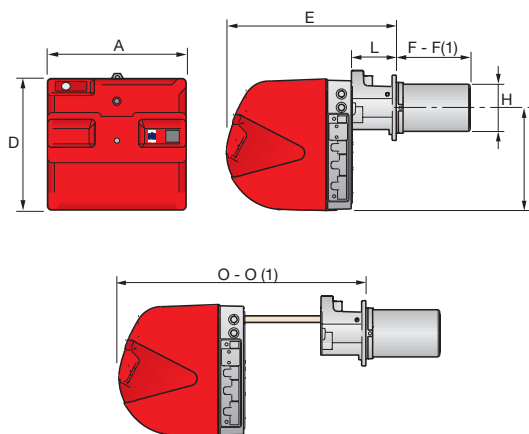


## Overall Dimensions (mm)

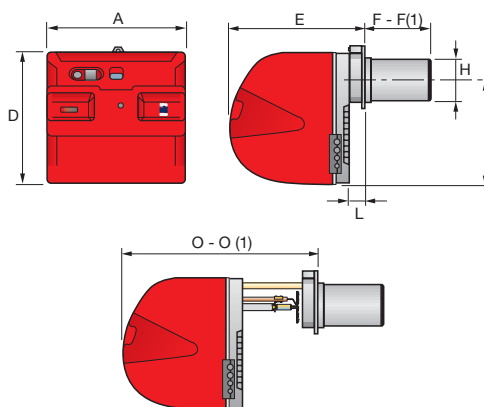
These models are distinguished by their reduced size, in relation to their output, which means they can be fitted to any boiler on the market.

### BURNERS

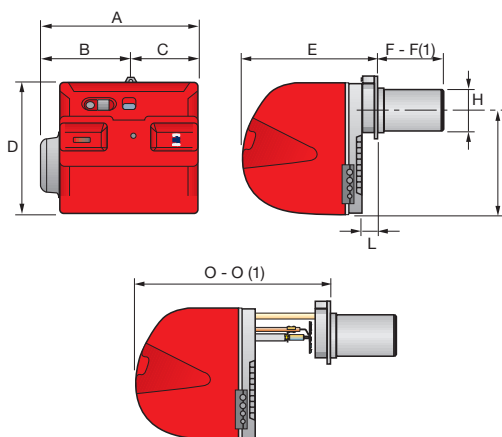
RL 34 - 44 MZ



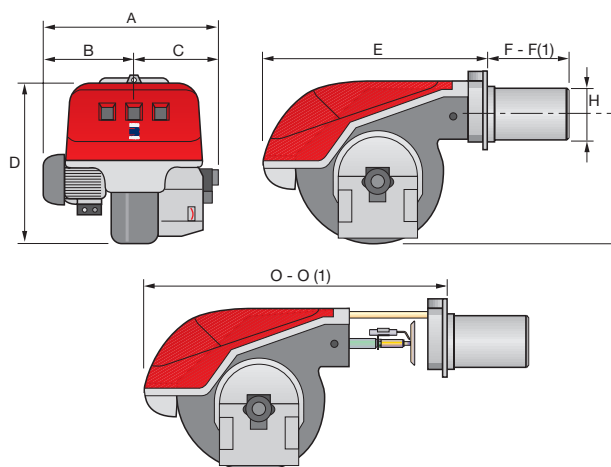
RL 50



RL 64 MZ



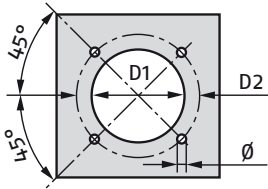
RL 70 - 100 - 130 - 190 - 250 MZ



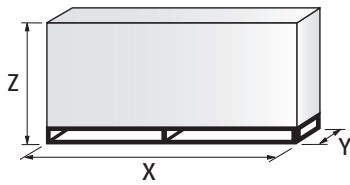
MODEL	A	B	C	D	E	F - F(1)	H	I	L	O - O(1)
RL 34 MZ	442	-	-	422	508	216 - 351	140	305	138	780 - 915
RL 44 MZ	442	-	-	422	508	216 - 351	152	305	138	780 - 915
RL 50	476	-	-	474	468	216 - 351	152	352	52	672 - 807
RL 64 MZ	538	300	238	490	477	250 - 385	179	335	60	680 - 815
RL 70	580	296	284	555	680	250 - 385	179	430	-	951 - 1086
RL 100	599	312	287	555	680	250 - 385	179	430	-	951 - 1086
RL 130	625	338	287	555	680	250 - 385	189	430	-	951 - 1086
RL 190	756	366	390	555	712	370 - 530*	222	430	-	1166
RL 250 MZ	910	432	478	555	705	378 - 528*	222	436	-	1163

(1) dimension with extended head.

\* by installation of extended head kit

**BURNER - BOILER MOUNTING FLANGE**

MODEL	D1	D2	Ø
RL 34 MZ	160	224	M8
RL 44 MZ	160	224	M8
RL 50	160	224	M8
RL 64 MZ	185	275 - 325	M12
RL 70	185	275 - 325	M12
RL 100	185	275 - 325	M12
RL 130	195	275 - 325	M12
RL 190	230	325 - 368	M16
RL 250 MZ	230	325 - 368	M16

**PACKAGING**

MODEL	X	Y	Z	kg
RL 34 MZ	1010	520	510	32
RL 44 MZ	1010	520	510	33
RL 50	1200	520	502	39
RL 64 MZ	1200	560	520	42
RL 70	1410	692	655	60
RL 100	1410	692	655	63
RL 130	1410	692	655	66
RL 190	1410	985	655	75
RL 250 MZ	1410	1040	655	140

## Installation Description

Installation, start up and maintenance must be carried out by qualified and skilled personnel. All operations must be performed in accordance with the technical handbook supplied with the burner.

### BURNER SETTING

All the burners have slide bars, for easier installation and maintenance.

After drilling the boilerplate, using the supplied gasket as a template, dismantle the blast tube from the burner and fix it to the boiler.

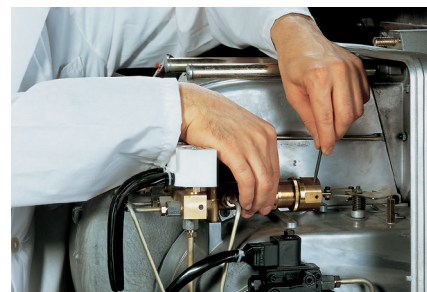
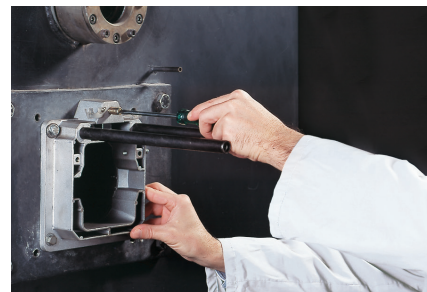
Adjust the combustion head.

Refit the burner casing to the slide bars.

Install the nozzle, choosing this on the basis of the maximum boiler output and following the diagrams included in the burner instruction handbook.

Check the position of the electrodes.

Close the burner, sliding it up to the flange, keeping it slightly raised to avoid the flame stability disk rubbing against the blast tube.



### HYDRAULIC AND ELECTRICAL CONNECTIONS AND START UP

The burners are supplied for connection to two pipes fuel supply system.

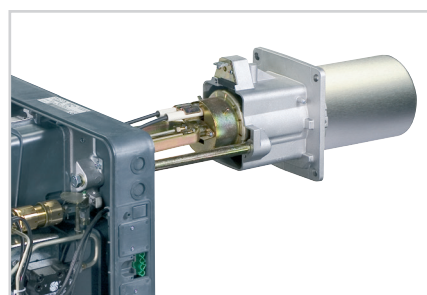
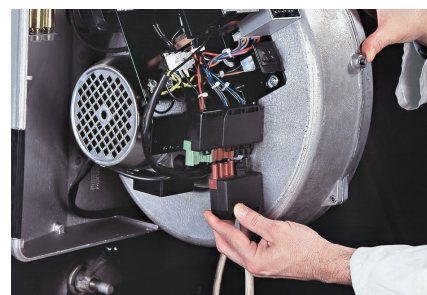
Connect the ends of the flexible pipes to the suction and return pipework using the supplied nipples.

Make the electrical connections to the burner following the wiring diagrams included in the instruction handbook.

Prime the pump by turning the motor.

On start up, check:

- Pressure pump (to max. and min.)
- Combustion quality, in terms of unburned substances and excess air.

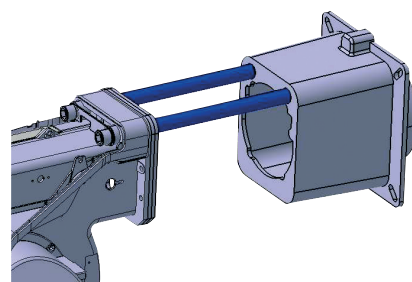


### BURNER MAINTENANCE

The maintenance of RL burners is very simple thanks to the sliding bars system that allows an easy access to the internal components.

In particular the RL 34-44 MZ models have a new sliding bars system to make easier the access to the combustion head.

The RL 190 and RL 250 MZ have new reinforced sliding bars that make very strong the burner structure during maintenance.



## Burner accessories

### NOZZLES



The nozzles must be ordered separately. The following table shows the features and codes on the basis of the maximum required fuel output.

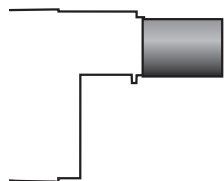
BURNER	NOZZLE TYPE	GPH	RATED OUTPUT (kg/h)			NOZZLE CODE
			10 bar	12 bar	14 bar	
RL 34 MZ	60°A	1,00	4,1	4,5	4,9	3042078
RL 34 MZ	60°A	1,25	4,7	5,2	5,6	3042094
RL 34 MZ	60°A	1,50	5,7	6,3	6,8	3042108
RL 34 MZ	60°A	1,75	6,7	7,3	7,9	3042114
RL 34 MZ	60°A	2,00	7,7	8,5	9,2	3042124
RL 34 MZ	60°A	2,50	9,6	10,6	11,5	3042144
RL 34 MZ	60°A	3,00	11,5	12,7	13,8	3042148
RL 34 MZ	60°A	3,50	13,5	14,8	16,1	3042164
RL 34 MZ	60°A	4,00	15,4	17	18,4	3042174
RL 34 MZ	60°A	4,50	17,3	19,1	20,7	3042184
RL 44 MZ	45°A	1,50	5,7	6,3	6,8	20011655
RL 44 MZ	45°A	1,75	6,7	7,3	7,9	20011658
RL 44 MZ	45°A	2,00	7,7	8,5	9,2	20011662
RL 44 MZ	45°A	2,50	9,6	10,6	11,5	20011666
RL 44 MZ	45°A	3,00	11,5	12,7	13,8	20011669
RL 44 MZ	45°A	3,50	13,5	14,8	16,1	20011672
RL 44 MZ	45°A	4,00	15,4	17	18,4	20011674
RL 44 MZ	45°A	4,50	17,3	19,1	20,7	20009760
RL 44 MZ	45°A	5,00	19,2	21,2	23	20011677
RL 44 MZ	45°A	5,50	21,1	23,3	25,3	20011678
RL 44 MZ	45°A	6,00	23,1	25,5	27,7	20011679
RL 50	60°B	3,00	11,5	12,7	13,8	3042158
RL 50	60°B	3,50	13,5	14,8	16,1	3042162
RL 50 - 64 MZ	60°B	4,00	15,4	17	18,4	3042172
RL 50 - 64 MZ	60°B	4,50	17,3	19,1	20,7	3042182
RL 50 - 64 MZ - 70	60°B	5,00	19,2	21,2	23	3042192
RL 50 - 64 MZ - 70	60°B	5,50	21,1	23,3	25,3	3042202
RL 50 - 64 MZ - 70	60°B	6,00	23,1	25,5	27,7	3042212
RL 50 - 64 MZ - 70	60°B	6,50	25	27,6	30	3042222
RL 64 MZ - 70 - 100	60°B	7,00	26,9	29,7	32,3	3042232
RL 64 MZ - 70 - 100	60°B	7,50	28,8	31,8	34,6	3042242
RL 64 MZ - 70 - 100	60°B	8,00	30,8	33,9	36,9	3042252
RL 64 MZ - 70 - 100	60°B	8,50	32,7	36,1	39,2	3042262
RL 64 MZ - 70 - 100 - 130	60°B	9,50	36,5	40,3	43,8	3042282
RL 64 MZ - 70 - 100 - 130 - 190	60°B	10,00	38,4	42,4	46,1	3042292
RL 64 MZ - 70 - 100 - 130 - 190	60°B	11,00	42,3	46,7	50,7	3042312
RL 64 MZ - 100 - 130 - 190 - 250 MZ	60°B	12,00	46,1	50,9	55,3	3042322
RL 64 MZ - 100 - 130 - 190 - 250 MZ	60°B	13,00	50	55,1	59,9	3042332
RL 64 MZ - 100 - 130 - 190 - 250 MZ	60°B	14,00	53,8	59,4	64,5	3042352

To be continued in the following page

**NOZZLES**

Continued from the previous page

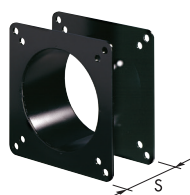
BURNER	NOZZLE TYPE	GPH	RATED OUTPUT (kg/h)			NOZZLE CODE
			10 bar	12 bar	14 bar	
RL 64 MZ - 100 - 130 - 190 - 250 MZ	60°B	15,00	57,7	63,6	69,2	3042362
RL 64 MZ - 100 - 130 - 190 - 250 MZ	60°B	16,00	61,5	67,9	73,8	3042382
RL 64 MZ - 130 - 190 - 250 MZ	60°B	17,00	65,4	72,1	78,4	3042392
RL 130 - 190 - 250 MZ	60°B	18,00	69,2	76,4	83	3042412
RL 130 - 190 - 250 MZ	60°B	19,00	73	80,6	87,6	3042422
RL 130 - 190 - 250 MZ	60°B	20,00	76,9	84,8	92,2	3042442
RL 190 - 250 MZ	60°B	22,00	84,6	93,3	101,4	3042462
RL 190 - 250 MZ	60°B	24,00	92,2	101,8	110,6	3042472
RL 190 - 250 MZ	60°B	26,00	99,9	110,3	119,9	3042482
RL 190 - 250 MZ	60°B	28,00	107,6	118,8	129,1	20018051
RL 250 MZ	60°B	30,00	110,4	122	132,4	3042502
RL 250 MZ	60°B	32,00	117,8	130,1	150,1	3042512
RL 250 MZ	60°B	35,00	128,8	142,1	154,5	3042522

**EXTENDED HEADS**


“Standard head” burners can be transformed into “extended head” versions, by using the special kit. The kits available for the various burners, giving the original and the extended lengths, are listed below.

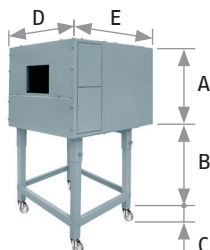
BURNER	'STANDARD' HEAD LENGTH (mm)	'EXTENDED' HEAD LENGTH (mm)	KIT CODE
RL 34 MZ	216	351	3010426
RL 44 MZ	216	351	3010425
RL 50	216	351	3010075
RL 64 MZ	250	385	3010114
RL 70	250	385	3010114
RL 100	250	385	3010115
RL 130	250	385	3010116
RL 190	370	530	3010444(*)
RL 250 MZ	378	528	3010422

(\*) Kit to be used on burners recognizable by a serial number that is over or equal to 02426XXXXXX, for burners with a serial number that is under or equal to 02416XXXXXX please use the Kit coded 3010197.

**SPACER KIT**


If burner head penetration into the combustion chamber needs to be reduced, varying thickness spacers are available, as given in the following table:

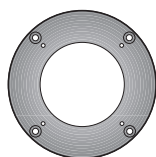
BURNER	SPACER THICKNESS S (mm)	KIT CODE
RL 34 - 44 MZ - RL 50	90	3010095
RL 64 MZ - RL 70 - 100 - 130	135	3010129
RL 190 - RL 250 MZ	110	3000722

**SOUND PROOFING BOX**

If noise emission needs to be reduced even further, sound-proof boxes are available, as given in the following table:

BURNER	BOX TYPE	A (mm)	B min-max	C	D (mm)	E	[DB(A)] (*)	KIT CODE
RL 34 - 44 MZ - RL 50	C1/3	650	372-980	110	690	770	10	3010403
RL 64 MZ								
RL 70 - 100 - 130								
RL 190	C4/5	850	160-980	110	980	930	10	3010404
RL 250 MZ	C7	1255	160-980	110	1140	1345	10	3010376

(\*) Average noise reduction according to EN 15036-1 standard

**CONNECTION FLANGE KIT**

A kit is available for use where the burner opening on the boiler is of excessive diameter.

BURNER	KIT CODE
RL 34 MZ - 44 MZ - RL 50	3010138

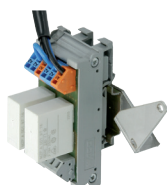
**DEGASING UNIT**

With single pipe systems, you can find air in the oil sucked by the pump that comes from the oil itself due to negative pressure or to a faulty seal.

To solve this problem, we recommend fitting a degassing unit near the burner. Two versions are available with or without filter:

BURNER	DEGASING UNIT WITH FILTER CODE (*)	DEGASING UNIT WITHOUT FILTER CODE (*)
RL 34 MZ - 44 MZ - 50 - 64 MZ	3010055	3010054
RL 70 - 100 - 130 - 190 - 250 MZ		

(\*) Max capability 80 kg/h (more filters are needed for higher flow).

**VOLT FREE CONTACT KIT**

A volt free contact kit is available for installation onto the burner. It can be used for a remote interface between burner operating signals.

Every burner can be equipped with a single kit to remote the flame presence signal and the burner lockout indication.

BURNER	KIT CODE
RL 34 MZ - 44 MZ - 64 MZ	3010419

**PC INTERFACE KIT**

To connect the control box to a personal computer for the transmission of operation, fault signals and detailed service information, an interface adapter with PC software are available.

BURNER	KIT CODE
All models	3002719



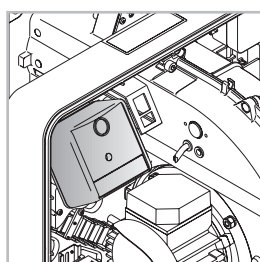
**GROUND FAULT INTERRUPTER KIT**



A "Ground fault interrupter kit" is available as a safety device for electrical system fault.

BURNER	KIT CODE
RL 34 MZ - 44 MZ	3010448

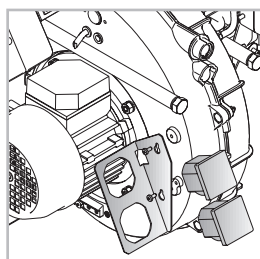
**POST-VENTILATION KIT**



To have 20 s ventilation after opening of thermostats chain, a special kit is available.

BURNER	KIT CODE
RL 34 MZ - 44 MZ	3010453

**HOURS COUNTER KIT**



To measure the burner working time a hours counter kit is available.

BURNER	KIT CODE
RL 34 MZ - 44 MZ	3010450

**PROTECTION KIT (ELECTROMAGNETIC INTERFERENCES)**

When the burner is installed in a room particularly subject to electromagnetic interference (signals emitted over 10 V/m) due for example to INVERTER presence or in systems where the lengths of the thermostat connections is over 20 meters, this specific protection kit is available as an interface between the thermostatic controls and the burner.

BURNER	KIT CODE
All models	3010386

**COMBUSTION HEAD KIT FOR REVERSE FLAME CHAMBER**



In certain cases, the use of the burner on reverse flame boilers can be improved by using an additional cylinder.

BURNER	STANDARD HEAD LENGTH WITH CYLINDER (mm)	EXTENDED HEAD LENGTH WITH CYLINDER (mm)	KIT CODE
RL 34 MZ - 44 MZ	319	429	3010178

# Specification

## DESIGNATION OF SERIES

A specific index guides your choice of burner from the various models available in the RL series. Below is a clear and detailed specification description of the product.

Series:		R					
Fuel:		S Natural Gas					
		L Light oil					
		LS Light oil/Natural Gas					
		N Heavy oil					
Size:							
Setting:		/1 Single stage					
		... Two stage					
		/M Modulating-Mechanical cam					
Emission:		...		Class 1 EN267 - EN676			
		MZ		Class 2 EN267 - EN676			
		BLU		Class 3 EN267 - EN676			
		MX		Class 2 EN267			
				Class 3 EN676			
Head length:		TC standard head					
		TL extended head					
Flame control system:		FS1		Standard (1 stop every 24 h)			
		FS2		Continuous working (1 stop every 72 h)			
Electrical supply to the system:							
		1/230/50		1/230V/50Hz			
		3/230/50		3/230V/50Hz			
		3/400/50		3N/400V/50Hz			
		3/230-400/50		3/230V/50Hz - 3N/400V/50Hz			
		3/220/60		3/220V/60Hz			
		3/380/60		3N/380V/60Hz			
		3/220-380/60		3/220/60Hz - 3N/380V/60Hz			
Auxiliary voltage:		230/50-60		230V/50-60H			
		110/50-60		110V/50-60Hz			

R	L	50			TC	FS1	3/230-400/50	230/50-60
BASIC DESIGNATION				EXTENDED DESIGNATION				

## AVAILABLE BURNER MODELS

BURNER MODELS			ELECTRICAL SUPPLY	AUXILIARY VOLTAGE	HEAT OUTPUT		TOTAL ELECTRICAL	NOTE
					(kW)	(kg/h)	POWER	
					(kW)	(kW)		
RL 34 MZ	TC	FS1	1/220-230/50-60	220-230/50-60	97/154-395	8,3/13-33,6	0,6	(1)
RL 34 MZ	TL	FS1	1/220-230/50-60	220-230/50-60	97/154-395	8,3/13-33,6	0,6	(1)
RL 44 MZ	TC	FS1	1/220-230/50-60	220-230/50-60	155/235-485	13/20-41	0,7	(1)
RL 44 MZ	TL	FS1	1/220-230/50-60	220-230/50-60	155/235-485	13/20-41	0,7	(1)
RL 44 MZ	TC	FS1	3/220-400/50-60	220-230/50-60	155/235-485	13/20-41	0,75	(1)
RL 44 MZ	TL	FS1	3/220-400/50-60	220-230/50-60	155/235-485	13/20-41	0,75	(1)
RL 50	TC	FS1	3/230-400/50	230/50-60	148/296-593	12,5/25-50	0,75	(1)
RL 50	TL	FS1	3/230-400/50	230/50-60	148/296-593	12,5/25-50	0,75	(1)
RL 50	TC	FS1	3/208-230/380-460/60	230/50-60	148/296-593	12,5/25-50	0,75	(1)
RL 50	TL	FS1	3/208-230/380-460/60	230/50-60	148/296-593	12,5/25-50	0,75	(1)
RL 64 MZ	TC	FS1	3/230-400/50	230/50-60	206/391-830	17,4/33-70	1,4	(1)
RL 64 MZ	TL	FS1	3/230-400/50	230/50-60	206/391-830	17,4/33-70	1,4	(1)
RL 70	TC	FS1	3/230-400/50	230/50-60	255/474-830	21,5/40-70	1,4	(2)
RL 70	TL	FS1	3/230-400/50	230/50-60	255/474-830	21,5/40-70	1,4	(2)
RL 70	TC	FS1	3/230-400/50	230/50-60	255/474-830	21,5/40-70	1,4	(1) (2)
RL 70	TL	FS1	3/230-400/50	230/50-60	255/474-830	21,5/40-70	1,4	(1) (2)
RL 70	TC	FS1	3/208-230/380-460/60	230/50-60	255/474-830	21,5/40-70	1,4	(2)
RL 70	TL	FS1	3/208-230/380-460/60	230/50-60	255/474-830	21,5/40-70	1,4	(2)
RL 100	TC	FS1	3/230-400/50	230/50-60	356/711-1186	30/60-100	1,8	(2)
RL 100	TL	FS1	3/230-400/50	230/50-60	356/711-1186	30/60-100	1,8	(2)
RL 100	TC	FS1	3/230-400/50	230/50-60	356/711-1186	30/60-100	1,8	(1) (2)
RL 100	TL	FS1	3/230-400/50	230/50-60	356/711-1186	30/60-100	1,8	(1) (2)
RL 100	TC	FS1	3/208-230/380-460/60	230/50-60	356/711-1186	30/60-100	1,8	(2)
RL 100	TL	FS1	3/208-230/380-460/60	230/50-60	356/711-1186	30/60-100	1,8	(2)
RL 130	TC	FS1	3/230-400/50	230/50-60	486/948-1540	41/80-130	2,6	(2)
RL 130	TL	FS1	3/230-400/50	230/50-60	486/948-1540	41/80-130	2,6	(2)
RL 130	TC	FS1	3/230-400/50	230/50-60	486/948-1540	41/80-130	2,6	(1) (2)
RL 130	TL	FS1	3/230-400/50	230/50-60	486/948-1540	41/80-130	2,6	(1) (2)
RL 130	TC	FS1	3/220-230/380-460/60	230/50-60	486/948-1540	41/80-130	2,6	(2)
RL 130	TL	FS1	3/208-230/380-460/60	230/50-60	486/948-1540	41/80-130	2,6	(2)
RL 190	TC	FS1	3/400/50	230/50-60	759/1423-2443	64/120-206	5,87	(2)
RL 190	TL	FS1	3/400/50	230/50-60	759/1423-2443	64/120-206	5,87	(2)
RL 190	TC	FS1	3/230/50	230/50-60	759/1423-2443	64/120-206	5,87	(2)
RL 190	TC	FS1	3/400/50	230/50-60	759/1423-2443	64/120-206	5,87	(1) (2)
RL 190	TC	FS1	3/230/50	230/50-60	759/1423-2443	64/120-206	5,87	(1) (2)
RL 190	TC	FS1	3/460/60	220/60	759/1423-2443	64/120-206	5,87	(2)
RL 190	TC	FS1	3/220/60	220/60	759/1423-2443	64/120-206	5,87	(2)
RL 250 MZ	TC	FS1	3/230-400/50	230/50-60	600/1250-2700	51/106-228	7,2	(2)
RL 250 MZ	TL	FS1	3/400/50	230/50-60	600/1250-2700	51/106-228	7,2	(2)
RL 250 MZ	TC	FS1	3/380/60	220/60	600/1250-2700	51/106-228	7,2	(2)
RL 250 MZ	TC	FS1	3/208-230/380-460/60	230/50-60	600/1250-2700	51/106-228	7,2	(2)

(1) with plug and socket (2) with terminal board

Net calorific value: 11,8 kWh/kg - 10200 kcal/kg - Viscosity at 20°C: 4-6 mm<sup>2</sup>/s (cSt).

The burners of RL series are in according to 2014/30/UE - 2014/35/UE - 2006/42/EC Directive and EN 267 Norm.

**WARNING:** nozzles are supplied as accessories that must be ordered separately; please refer to the "Burner Accessories" section.

### Bio fuels

Riello Burners is able to offer technical variants which allow burners to be used within environmental heating, process or special applications. These applications now include solutions for liquid Bio fuels (i.e. biodiesel and vegetable oil). Our experience in research and development and field applications with organic origin Bio fuels has resulted in Riello being able to offer a wide range of solutions for the combustion of Bio fuels.

These burner variants can be provided upon request and after a technical-commercial evaluation; for more information please contact Riello Burners Commercial and Technical Department, our Application Engineers will be pleased to help you.

## SPECIFICATION

### STATE OF SUPPLY

#### **Burner RL 34 MZ – 44 MZ**

Monoblock forced draught oil burner with two stage operation, fully automatic, made up of:

- Air suction circuit **with sound proofing material**
- High performance fan with straight blades
- Air damper for air setting controlled by an adjustable hydraulic ram
- Starting motor at 2800 rpm, single-phase / 220-230V / 50-60Hz or three-phase 380-400V / 50-60Hz
- Combustion head, that can be set on the basis of required output, fitted with:
  - stainless steel end cone, resistant to corrosion and high temperatures
  - ignition electrodes
  - flame stability disk
- Exclusive patented HCS (Housing Cooling System) with high thermal insulation and air circulation with continuous air volume refresh for an active cooling system and avoid heat transfer to the electrical component housing
- Gears pump for high pressure fuel supply, fitted with:
  - filter
  - pressure regulator
  - connections for installing a pressure gauge and vacuumeter
  - internal by-pass for single pipe installation
- Valve unit with an oil safety valve and two delivery oil valves on the output circuit
- Photocell for flame detection
- Microprocessor-based burner safety control box, with diagnostic function
- Plugs and Sockets for electrical connection, accessible from the external of the cover
- Burner on/off switch
- Flame inspection window
- 1<sup>st</sup> - 2<sup>nd</sup> stage manual switch
- Slide bars for easier installation and maintenance
- Protection filter against radio interference
- IP 44 electric protection level.

Standard equipment:

- 2 flexible pipes for connection to the oil supply network
- 2 gaskets for the flexible pipes
- 2 nipples for connection to the pump
- 4 screws for fixing the burner flange to the boiler
- 1 thermal screen
- 2 Plugs for electrical connection (RL 34-44 MZ single-phase)
- 3 Plugs for electrical connection (RL 44 MZ three-phase)
- 2 slide bar extensions (for the extended head models)
- Instruction handbook for installation, use and maintenance
- Spare parts catalogue.

**STATE OF SUPPLY****Burner RL 50 – 64 MZ – 70 – 100 – 130 – 190 – 250 MZ**

Monoblock forced draught oil burner with two stage operation, fully automatic, made up of:

- Air suction circuit lined with sound-proofing material
- Fan with reverse curve blades (RL 50 – 70 – 100 – 130 models) or straight blades (RL 64 MZ – 190 – 250 MZ models)
- Air damper for air setting controlled by an adjustable hydraulic ram (or by a servomotor for the RL 250 MZ)
- Starting motor at 2800 rpm, three-phase 400V with neutral, 50Hz
- Combustion head, that can be set on the basis of required output, fitted with:
  - stainless steel end cone, resistant to corrosion and high temperatures
  - ignition electrodes
  - flame stability disk
- Gears pump for high pressure fuel supply, fitted with:
  - filter
  - pressure regulator
  - connections for installing a pressure gauge and vacuumeter
  - internal by-pass for single pipe installation
- Valve unit with an oil safety valve and two delivery oil valves on the output circuit
- Photocell for flame detection
- Microprocessor-based burner safety control box, with diagnostic function
- Burner on/off switch
- Flame inspection window
- 1<sup>st</sup> – 2<sup>nd</sup> stage manual switch
- Slide bars for easier installation and maintenance
- Protection filter against radio interference
- IP 44 electric protection level.

**Standard equipment:**

- 2 flexible pipes for connection to the oil supply network
- 2 gaskets for the flexible pipes
- 2 nipples for connection to the pump
- 4 screws for fixing the burner flange to the boiler
- 1 thermal screen
- Fairleads for electrical connections (RL 50 models)
- 2 slide bar extensions (for the extended head models and the RL 190 – 250 MZ models)
- Instruction handbook for installation, use and maintenance
- Spare parts catalogue.

# Riello Burners a world of experience in every burner we sell.

7/2018  
T50035UK06



[ 1 ]

Across the world, Riello sets the standard in reliable and high efficiency burner technology.

With burner capacity from 5 kW to 48 MW, Riello gas, oil, dual fuel and Low Nox burners deliver unbeatable performance across the full range of residential and commercial heating applications, as well as in industrial processes.

With headquarter in Legnago, Italy, Riello has been manufacturing premium quality burners for over 90 year. The manufacturing plant is equipped with the most innovative systems of assembling lines and modern manufacturing cells for a quick and flexible response to the market.



[ 2 ]

Besides, the Riello Combustion Research Centre, located in Angiari, Italy, represents one of the most modern facility in Europe and one of the most advanced in the world for the development of the combustion technology.

Today, the company's presence on worldwide markets is distinguished by a well-constructed and efficient sales network, alongside many important Training Centres located in various countries to meet its customers' needs. Riello has 13 operational branches abroad (in Europe, America and Asia), with customers in over 60 countries.

[ 1 ] BURNERS PRODUCTION PLANT  
S. PIETRO, LEGNAGO (VERONA) – ITALIA

[ 2 ] HEADQUARTER BURNERS DIVISION  
S. PIETRO, LEGNAGO (VERONA) – ITALIA

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